Driver distraction by in-car technologies

July 2015

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Introduction

In June 2014 the Government released New Zealand’s Intelligent Transport Systems Technology Action Plan 2014-2018\(^1\). Intelligent Transport systems (ITS) are those in which information, data processing, communication, and sensor technologies are applied to vehicles, infrastructure, operating and management systems to provide benefits for transport service users. The Action Plan outlines the Government’s strategic approach to encouraging and enabling intelligent transport systems in New Zealand.

Included among the 42 actions in the Action Plan are two related to addressing the risk of driver distraction presented by developing technologies.

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<th>Action</th>
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<td>41</td>
<td>Review international research on the implications of new ITS systems in relation to operator distraction</td>
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<tr>
<td>42</td>
<td>Review current New Zealand legislation relating to driver distraction from in-vehicle technologies</td>
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This report addresses Action 41 and updates a literature review that was commissioned by the Ministry of Transport, in 2013, on driver distraction. The review, *Distracted Driving and In-Vehicle Devices* was prepared by a student at Victoria University Wellington, Tyler Rickard-Simms, under the supervision of Associate Professor Val Hooper.\(^2\) It was a wide ranging and comprehensive review. However, since it was completed there have been further developments in technologies which might provide driver distractions. There is also a need to identify what sorts of solutions have been developed internationally, so that they might inform the approach New Zealand takes. This report on driver distraction builds on Rickard-Simms’s earlier literature review, and should be read in conjunction with this earlier report.

While this report does identify current New Zealand regulation that relates to driver distraction, Action 42 will be addressed more fully under a wider review of all transport legislation, which will identify unnecessary barriers to the continued deployment of ITS technologies in New Zealand (Action 7)\(^3\).

Distraction is an issue for all transport modes, including aviation and maritime, but this report focuses on distractions affecting motor vehicle drivers. These are the transport operators most likely to be involved in a crash due to distraction by an integrated or nomadic device (a device brought into the motor vehicle). Over the period 2004–2008 distraction, or inattention, contributed to at least 10 percent of fatal crashes and 9 percent of serious injury crashes. In 2008, these crashes resulted in 245 serious injuries and 42 deaths.\(^4\)

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\(^1\) Intelligent Transport Systems Technology Action Plan 2014-18 *Transport in the digital age*


New Zealand does have Land Transport Rules in place that seek to prevent driver distraction (see Appendices A & B). However, technology is developing at a rapid pace, and the public is beginning to demand certainty about which technologies can be adopted safely (and lawfully) and which might present unacceptable risks of distraction. Because this technology may develop faster than it is possible to legislate, (and the fact that more functions are increasingly contained within a single device e.g. smart phones) it is necessary for New Zealand to reassess current regulatory design as it relates to ITS.

Types of distraction

This report uses the same three categories of distraction identified by Rickard-Simms: physical, cognitive and emotional distractions. A brief description of each type of distraction is set out below.

Physical distractions

Physical distractions involve a driver actually interacting with a device (e.g. the physical impairment of removing a hand from the steering wheel to accomplish a task), or taking their eyes off the road ahead to do so.

Rickard-Simms draws on research that suggests that any device which distracts a driver for more than two seconds significantly increases their chance of crashing.

The primary distraction is in relation to the ‘glance time’ such devices require from the driver, sometimes referred to as a visual distraction. The driver is more at risk if any one glance at a device exceeds two seconds, or if total time spent looking at a device to achieve a task takes more than 14 seconds. Research by the United States National Highway Traffic Safety Administration (NHTSA), based on a 100 car naturalistic study (where 100 vehicles were instrumented and driven normally between January 2003 and July 2004), suggested that physical distractions were the most significant type of distraction. The age of this study, however, means that it did not address texting or smart phones, which are among the riskiest devices.

Cognitive distractions

Cognitive distraction is related to overloading a driver’s ability to process the key information required to drive safely. Key information gets crowded out by other, less important, things. Cognitive distractions include mental tasks such as making choices between options, remembering things, or even reading and interpreting vehicle instrumentation. Almost any action that requires the driver to think can become a cognitive distraction. For example, text

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8 ibid., 25.
messaging can be cognitively distracting due to the widespread use of contractions, emoticons and non-standard language.

While individual cognitive distractions may have little effect on a driver’s likelihood of crashing, they are rarely encountered in isolation. As few as two cognitive distractions simultaneously can begin to lead to an ‘information overload’.

**Emotional distractions**

Emotional distractions are potentially the most distracting category of distractions. They are distractions that cause the driver to engage with another task on an emotional basis, and disrupt their focus on driving at very high levels. The high levels of disruption are because emotional distractions physically narrow drivers’ vision and disrupt a driver’s control over a vehicle. There is potential, in contrast to physical distractions, and to a lesser extent cognitive distractions, that drivers will be unaware of the extent to which emotional distractions impair their performance.

Emotional distraction, by the nature of the content rather than the mechanism through which it is delivered, can be the main cause of distraction by devices such as cell phones, televisions and music devices.

**Why is technology an issue?**

In vehicle technology developments are a challenge because of the number of visually demanding elements incorporated into driving tasks is increasing. Increased information can be useful to help improve drivers’ performance, navigation and safety. However, this information may also divert their attention away from immediate driving tasks (such as maintaining following distances, keeping left etc), and increase the chance of accidents. Too much time spent looking at navigation devices, efficiency information or warning sensors will make safe driving impossible.

While there are many distractions that are not directly related to technology, they are not the focus of this report. Technologies are developing quickly, and many are developing in advance of legislation. In the past, legislation in New Zealand and internationally has sought to ban individual technologies. As more devices are included in vehicles, both for legitimate driving tasks and for distracting activities, this approach is unlikely to remain effective. This report looks at the distraction potential of several technologies, and looks at possible approaches to addressing driver distraction by technology in future.

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Individual technologies

The following section will outline the distraction risk potential of several individual technologies that were not covered in Rickard-Simm's earlier report.

Connected Vehicles

Benefits

Connected vehicles are a suite of technologies in development that allow vehicles to communicate with each other and infrastructure. They have the potential to greatly improve road safety, efficiency and potentially infrastructure planning. Advisory messages or warnings may be supplied to a driver through flashing lights, auditory signals or haptic feedback (vibrating the seat or steering wheel). Automated systems may even take control of the vehicle away from the driver in order to prevent an accident.

Figure 1: Examples of connected vehicle use cases

Potential for distraction

At present, these technologies are still under development, with trials being run in places like the University of Michigan Transport Research Institute (UMTRI). The relatively early stage of these technologies makes it hard to determine what their impact is likely to be on driver distraction. However, it is possible to say that the advisory warnings and messages have the potential to be distracting.

Such distraction could take the form of physical distraction from actually reading the messages to cognitive distraction, from systems which use a simple beep to advise of multiple hazards, if drivers have to determine what a message is trying to tell them.

It is important that false-positives (warnings that suggest there is a hazard when there is none) be kept to a minimum, or the entire connected vehicle system may become little more than a source of driver distraction. The risk of distraction is magnified if poor functioning systems cause frustration which lead to emotional distractions. Too many false positives would also mean that drivers are unlikely to take notice of any real hazards.

Legislation

There is no specific legislation regarding the use of connected vehicles in New Zealand. However, section 7 of the Land Transport Act 1998 does provide that “a person may not drive a motor vehicle, or cause a motor vehicle to be driven, recklessly… or in a manner which… is or might be dangerous to the public or to a person” and section 8 forbids driving “without reasonable consideration for other persons” (see Appendix C). These sections might be applied where driver distraction (from a connected vehicle) results in a vehicle being driven recklessly or dangerously.

**Automated vehicles**

**Benefits**

Automated vehicles\(^{12}\) are among the most promising emerging transport technologies. As more than 90 per cent of accidents are caused by the driver,\(^{13}\) the ability to safely automate driving offers huge safety benefits. There are also potential efficiency benefits due to smoother driving and the ability for cars to travel closer together.

Several authorities, including the International Transport Forum (ITF) and Society of Automotive Engineers (SAE) have identified that the automation of vehicles exists on a spectrum\(^ {14}\) (see table below for an example) – though debate continues about what each level should mean.

<table>
<thead>
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<th>Level</th>
<th>Description</th>
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<tr>
<td>0</td>
<td>The human driver is in complete control of all the functions of the car</td>
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<tr>
<td>1</td>
<td>One function is automated</td>
</tr>
<tr>
<td>2</td>
<td>More than one function is automated at the same time, but the driver remains attentive</td>
</tr>
<tr>
<td>3</td>
<td>Driving functions are sufficiently automated – the driver can engage in other activities</td>
</tr>
<tr>
<td>4</td>
<td>The car is self driving – no human driver required</td>
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**Figure 2: Example of an autonomous vehicle spectrum**

In all but the highest level of automation, where the vehicle is self-driving, some human intervention may be necessary. Semi-autonomous vehicles (levels 1-3) are likely to be the main type of automated vehicle in the foreseeable future. The need for automated vehicles to interact with older, non-automated vehicles will also reduce some of the potential benefits.

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\(^{12}\) Including 'Driverless Cars', ‘Self Driving Cars’ and “Automated Vehicles”.

\(^{13}\) National Highway Traffic Safety Administration, “THE RELATIVE FREQUENCY OF UNSAFE DRIVING ACTS IN SERIOUS TRAFFIC CRASHES” (Accessed December 22, 2014)

http://www.nhtsa.gov/people/injury/research/udashortrpt/background.html


Potential for distraction

Distraction is unlikely to come from the automation of driving itself. However, as vehicles are able to take on more of the driving task, drivers may feel that they need to pay less attention. In this way, the increased safety benefits offered by automated vehicles may become a victim of risk compensation, where people compensate for increases in safety by adopting riskier behaviour.\(^{15}\) Risk compensation has been well observed in relation to road safety in the past.\(^{16}\)

Examples of such behaviour might include drivers following too closely, allowing themselves to become distracted more easily, or relying on an automatic emergency braking (AEB) system to prevent accidents. This is a less than ideal situation, as automation technologies, such as AEB systems, vary in their effectiveness (for example different models have different maximum speeds at which they are effective).\(^{17}\) More broadly, while automation remains an assistant, rather than a replacement to the driver, we have to be prepared for the potential for over-reliance on vehicle systems.

There are also questions about how quickly drivers of semi-autonomous vehicles will be able to intervene in an emergency. If they rely on the vehicle’s automated functions, and regularly allow themselves to become distracted, drivers may not be in a position to take control in urgent situations. Furthermore, as automation becomes increasingly common, and the need for driver intervention less common, questions may need to be asked about drivers’ ongoing ability to control the vehicle at all.

Issues of distraction regarding automated vehicles are likely to be most pressing for levels 2 and 3 in the spectrum above. At level 2 (and even potentially at level 1) the driver may overestimate the amount of the driving task being controlled autonomously, leading to dangerous distraction. At level 3, if a driver is able to safely engage in other activities, their ability to react to an emergency (when the car may need to return control to the driver) may be impaired.

Legislation

There is no specific legislation regarding the use of automated vehicles in New Zealand.

Hands-free devices

Benefits

Hands-free systems have been touted by several manufacturers as presenting a solution to many of the problems of driver distraction particularly those relating to cell phone use. These systems remove the need to physically interact with a cell phone, to send a message or engage in a phone call, and are often able to be easily and cheaply retrofitted.


Recent research by the American Automobile Association has found that while three quarters of drivers believe that hands-free systems improve their safety, by reducing distraction, they may in fact reduce safety.\(^{18}\) Furthermore, a study by the New Zealand Automobile Association rated the use of a cell phone with a hands free kit as the seventh most serious driver distraction, alongside the use of a satellite navigation system.\(^{19}\) The emotional distraction potential of a phone call is not addressed by the use of a hands free kit. This emotional risk has been identified as the most dangerous component of cell-phone caused risk.

**Legislation**

Hands-free devices for phone calls are specifically exempted from the ban on cell phone use while driving. This is despite the fact that the NZ Transport Agency recognises that “the risk of crashing while using a hands-free kit is still higher than when not using a phone at all”.\(^{20}\) This parallels Rickard-Simms’ research, which suggests that it is the physical distraction of a cell phone is less risky than the emotive and cognitive distractions still present in a hands-free system.

**Voice-to-text systems**

**Benefits**

Voice-to-text systems use microphones and computer software to convert spoken words to a text format, or to control in-car systems directly. They may be useful to address physical distractions of some technology, such as tuning a radio or dialling a phone.

**Potential for distraction**

The risk with voice-to-text systems is that while reducing physical distractions, they can significantly increase cognitive distractions. This is particularly apparent in current systems that can be complicated and time consuming to use. Drivers must think carefully about how to phrase their commands because some systems require “exact phrases to accomplish specific tasks”.\(^{21}\) Similarly, voice-to-text systems (such as composing or reading aloud text messages or emails) are significantly more distracting than ‘more traditional voice-based interactions on the cell phone”.\(^{22}\) Distraction is also made much worse when operator or system error means tasks must be tried several times before the correct command is given.\(^{23}\)


\(^{22}\) Strayer et.al., 4.

\(^{23}\) ibid.
A further risk of hands free kits is that there may be emotional distractions if drivers become angry or agitated after repeated failures. A study by J.D. Power found that inaccurate and frustrating voice recognition software was the number one complaint drivers had with their vehicle.\(^\text{24}\)

**Legislation**

Land Transport Rule 7.3 sub-clause 1A provides that a driver must not, while driving a vehicle, use a mobile phone to make, receive, or terminate a text message. The exception to the ban on phone calls while using a hands-free kit does not apply to text messages (see appendix B). This means that a driver using a hands free device to send a text message is likely to be in breach of the regulation. This is because the Rule prohibits the act of creating a text message itself, rather than the physical action normally required to do so. The situation is unclear however as the Rule was written before voice-to-text technologies were widely used in vehicles or nomadic devices. For example, Apple’s Siri was included in iPhones in 2011,\(^\text{25}\) and Google Now (a similar service) was released in 2012\(^\text{26}\).

Sections 7 and 8 of the Land Transport Act 1998 (see Appendix C) may also apply where driver distraction (by a voice-to-text system) results in a vehicle being driven carelessly, recklessly or dangerously.

**In-car entertainment systems**

**Potential for distraction**

In-car entertainment systems also have the potential to be extremely distracting. These systems are by their nature multipurpose. They can enable functions from controlling the radio, air conditioning or vehicle settings, to enabling phone calls, navigation and even surfing the internet.

The Tesla flagship Model S is fitted with a large, 17 inch, internet connected computer with a touch-screen display. This presents a huge potential for distraction. Consumerreports.org asks us to:

> Imagine driving while using your iPad to play music, and look at Google maps. Now imagine your iPad is built into the car and also runs your climate control, phone, and even basic car controls, such as braking, steering, suspension, and sunroof settings… We found the system overall is quick and easy to use, but the potential for distraction is very real.\(^\text{27}\)


The almost total lack of physical controls involved in touch screen interfaces means that drivers must look away from the road, sometimes several times to negotiate nested menus, to make adjustments. Several other manufacturers, including Volvo and Ford, are looking at similar touch screen interfaces. Because they are built into the vehicle, proprietary systems are likely to be less distracting than nomadic devices, such as tablets, being used for the same purpose. There is potential for an untethered tablet to move uncontrollably during driving, with the potential for injury, damage and distraction. However, requiring nomadic devices be securely mounted may mitigate this problem.

Despite this, even a securely mounted or in-built system retains the physical and cognitive distractions involved in interacting with it, as well as any emotional distraction caused by any online content accessed.

Legislation

There is no specific legislation regarding the use of in-car entertainment systems in vehicles in New Zealand. However, sections 7 and 8 of the Land Transport Act 1998 (see Appendix C) may apply where driver distraction (by an in-car entertainment system) results in a vehicle being driven carelessly, recklessly or dangerously.

Heads up displays

Benefits

Heads up displays (HUDs) project important information onto the windscreen in front of a driver. This is aimed at reducing the need to look away from the road to get useful information, such as speed and navigation. HUDs have been widely used in civil and military aviation since the 1960s and 1970s, and began to be fitted to cars in the late 1980s.

Continental (a large European manufacturer of components for the transport industry) is also developing an augmented reality (AR) HUD. This system incorporates information from the lane departure warning, adaptive cruise control and navigation systems, and projects them on top of the actual road layout ahead.

Jaguar-Land Rover is experimenting with similar technology to remove blind spots by projecting images on parts of the car’s body work (such as pillars and bonnet) to make them appear transparent.

Potential for distraction

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It is important to ensure that the information presented to drivers on a HUD does not become distracting. This may be the case if drivers overestimate their ability to keep monitoring the road while looking at the HUD. It may be important to remind drivers that even though it is projected against the road, by focusing on a HUD, they are taking attention away from monitoring the road and other traffic.

**Legislation**

There is no specific legislation regarding the use of HUDs in vehicles. However it is possible that current prohibitions on television screens and may effectively ban them already (see Appendix A). Sections 7 and 8 of the Land Transport Act 1998 (see Appendix C) may also apply where driver distraction (by a HUD) results in a vehicle being driven carelessly, recklessly or dangerously.

**Smart phones as telematics**

**Benefits**

Smart phones are increasingly used to provide real time information to transport users. Apps have been developed to use inbuilt gyroscopes and satellite positioning. These uses may help improve driver efficiency (by giving them real time feedback about their driving performance), or improve system efficiency by providing real-time information about the transport system (for example reducing congestion by allowing drivers to chose alternate routes).

There is also an increasing trend for smart phones and tablets to be mounted in a cradle on bicycle handlebars. These apps can provide basic information such as speed and navigation, or log trips to calculate exercise and recreational statistics. Tablets are also integral to some cycle-hire schemes, where they handle tracking, payment and other aspects of the business. Some new electric bicycles even use a handlebar mounted smart phone to control the output of their motor. Many of these uses might also be possible for motorcyclists.

**Potential for distraction**

The use of smart phone-based telematics is potentially very distracting for drivers. The MonkeyParking app (sic) allows drivers to request a parking spot provided by other app users with a spare driveway for a fee. This requires a driver (or potentially one of their passengers) to interact with the app while driving.

The apps are particularly distracting because operating them (or observing them) while driving is a key component of their functionality. The San Francisco City Attorney issued a cease-and-desist demand to MonkeyParking on June 23, 2014, in part because it was found to be:

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facilitating and encouraging drivers to use cellphones and other wireless communication devices in a manner that distracts them, posing a safety hazard to the public and violating state laws that prohibit using cellphones and such other devices while driving.  

Smart phones used as telematic devices have the potential in particular to present physical distractions, as well as any cognitive distractions involved in reading and interpreting the information presented.

Legislation

There is no specific legislation regarding the use of smart phones in vehicles for telematics. However, sections 7 and 8 of the Land Transport Act 1998 (see Appendix C) may apply where driver distraction (by a smart phone telematics system) results in a vehicle being driven carelessly, recklessly or dangerously.

There is an element of addiction to some distracting devices.

Many jurisdictions have enacted bans on particularly distracting devices and device uses, such as text messaging and handset phone calls. However, anecdotal and some empirical evidence suggest that these approaches are less effective than expected. Emerging research in the United States is suggesting that distracted driving behaviour shows evidence of addiction to some distracting devices, particularly cell phones.

A recent study by AT&T (a large American telecommunications company) into the rates of texting and driving found that 75% of participants admitted to “glancing at their phones while behind the wheel” and that rates of compulsive cell phone use behaviours occur at twice the rate of self-reported cell phone addiction.

A similar study by the AA in New Zealand found that despite 84% of drivers agreeing that texting while driving was distracting, 20% of respondents admitted to doing so. The rate was even higher for young drivers (18-24), where nearly half admitted to breaking the law banning phone use while driving. Texting (along with reading a magazine or newspaper) was rated as the most distracting activity, using a handheld phone was third and adjusting music was fourth. Four of the top five most distracting activities can be done on a smart phone – highlighting the increasing risk of this individual device.

If driver distraction involves elements of addiction, the methods used to address it may need to be re-examined. Any actions may need to explicitly take account of the issues related to addiction. In this context, simple prohibition is unlikely to have the desired policy outcomes and some studies have suggested that fines are an ineffective method to reduce cell phone

36 AA Insurance, “TXTing, reading, and attractive pedestrians all distracting for drivers.”
37 ibid.
use while driving. We may need to look at policy options more common in the health and social sectors (for example anti-smoking or anti-gambling campaigns).

Tools such as Vodafone DriveSafe and AT&T DriveMode respond automatically to phone calls and text messages, and may silence message alerts. AT&T’s app also attempts to use drivers’ family relationships to fight phone addiction: it has tools specifically for young drivers, alerting parents if DriveMode is turned off or ‘Auto-Mode is disabled’.

International approaches to reducing driver distraction.

No jurisdiction appears to have developed a way to address distraction fully. Nevertheless, there may be much that New Zealand can learn from other countries about how to prevent driver distraction, and the effectiveness of various methods.

Some of the key jurisdictions relevant to New Zealand are Australia, the US, the EU and Japan. These are the primary sources of the standards that influence the makeup of the New Zealand fleet. Technologies mandated or forbidden by these jurisdictions are likely to influence the way New Zealanders’ cars are built.

The primary approach seems to be banning specific technologies, notably mobile phones, and issuing fines and/or demerit points. There may be issues in the future as smart phones are increasingly becoming omni-capable devices, with legitimate in-vehicle uses (including as a satellite navigation device or for real-time telematics). The key question is, how do regulators determine when a device use is legitimate, and when it should be prohibited?

US Approaches

The United States Federal Government, under the auspices of the National Highway Traffic Safety Administration, has a dedicated website addressing driver distraction: distraction.gov. It outlines government actions, and encourages Americans to “make the commitment to drive phone-free” by signing an informal pledge on their website. The focus of this effort is to remind drivers and passengers of their individual responsibility not to become, or let others become, distracted.

There is also general legislation, which prohibits driving “without due care and attention”. Legislation differs between states and territories. However most states individually passed laws related to distracted driving. Most have banned text messaging for all drivers and 10

43 Janitzek, et al. “Study on the regulatory situation in the member states” 72
states prohibit drivers from holding cell phones while driving.\textsuperscript{44} There are also restrictions on cell phone use placed specifically on younger drivers, or those with a learner’s permit or intermediate licence.\textsuperscript{45}

There have also been some more specific prohibitions. In 2009, the US President issued an executive order prohibiting federal employees from texting while driving on government business or with government equipment.\textsuperscript{46} Also, in 2010, the Federal Motor Carrier Safety Administration enacted a ban that prohibits commercial vehicle drivers from texting while driving.\textsuperscript{47}

In April 2013, the NHTSA also published voluntary guidelines to minimise distraction by in vehicle electronic devices.\textsuperscript{48} These guidelines specifically refer to in built technology, and are to be followed in future by a second set of guidelines relating to nomadic or brought in devices. The guidelines are aimed primarily at manufacturers of vehicle and vehicle equipment, rather than the public. It encourages them to design vehicles and vehicle equipment to reduce the chances that vehicle equipment will be distracting to a driver.

The guidelines include recommending \textit{per se} lock outs of certain activities while driving, including displaying, video not related to driving or text from books or magazines. It also suggests specific features of the human-machine interface, including that devices should not require the driver to look away from the road at a large angle (greater than 30\textdegree), use both their hands or glance at the device for too long.\textsuperscript{49}

The NHTSA has no plans at this stage to mandate the recommendations set out in their guidelines. However, it plans to monitor manufacturers’ voluntary uptake of these guidelines to inform its continuing research regarding distracted driving.

\textbf{Australian Approaches}

Though legislation is slightly different among states and territories, Australia’s policies are broadly consistent across the Commonwealth. Australia has a similar approach to New Zealand, with a ban on drivers using specific technologies, namely hand-held cell phones and portable televisions. The penalties in Australia are rather more severe than New Zealand however, with a $300-400 fine for using a driver cell phone, and similar fines for using a portable television.

\textsuperscript{45} Janitzek, et al. “Study on the regulatory situation in the member states” 72
\textsuperscript{49} They define this as no more than 2 seconds per glance, and a total time glance time of no more than 12 seconds in total.
There are also more general provisions for Australian police to ‘reprimand drivers who they think are driving “carelessly” or “dangerously”’ – this tends to be used where a driver has been distracted and an accident occurs.\textsuperscript{50}

As part of the Australian National Road Safety Strategy 2011-2020, the Australian Transport and Infrastructure Council has committed to “investigate technology based options to minimise driver distraction from in-vehicle devices”.\textsuperscript{51}

\textbf{European Approaches}

The division of states in the European Union means that there is some variation in the extent, prescription and penalties among local regimes. However, on the whole, distraction seems to be a less pervasive issue in Europe compared to America. A United States Centre for Disease Control and Prevention study found that while more than 65 per cent of US drivers had used their cell phone while driving in the past 30 days, rates in 11 European countries ranged between 20 to 60 per cent.\textsuperscript{52}

A comprehensive report detailing the regulatory situation in member states of the European Union was prepared by the European Commission in 2010. It looked at whether there was specific, general or no legislation to control the use of mobile phones, personal navigation devices, music players or TV/Video players. The results are below.\textsuperscript{53}

Of the 27 EU member states, 26 have specific legislation on cell phone use, and stipulate specific requirements, such as hands free use. The only country not to specifically legislate against cell phone use is Sweden, which relies on general cautions that “to avoid accidents, road users shall observe care and attention that the circumstances demand”.\textsuperscript{54}

Many of the countries also have specific or general provisions for other devices. Unlike New Zealand, several jurisdictions do have specific provisions related to music players and navigation devices. It is unclear how this relates to smart phones, which may be used as navigation devices, music players and TV/video players alongside their mobile phone use.

\begin{itemize}
\item \textsuperscript{50} Timmo Janitzek et. al., “Study on the regulatory situation in the member states regarding brought in (i.e. nomadic) devices and their use in vehicles” European Commission. (Accessed November 24, 2014).
\item \textsuperscript{52} Rebecca B. Naumann, & Ann M. Dellinger, “Mobile device use while driving--United States and seven European countries” Morbidity and Mortality Weekly Report. (Accessed November 24, 2014).
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6210a1.htm?s_cid=mm6210a1_w
\item \textsuperscript{53} Janitzek, et al. “Study on the regulatory situation in the member states.” 39.
\item \textsuperscript{54} ibid., 40.
\end{itemize}
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Figure 3 Legislation for distracting devices in different European countries

**Japanese Approaches**

A large proportion of vehicles come to New Zealand used, built to Japanese standards. Japan’s regulations indicate the sorts of solutions or issues that are likely to be ‘built in’ to these vehicles.

Japan’s driver distraction laws are much more comprehensive than most of the other countries identified in this report. In 1999, Japan prohibited “drivers from using wireless communication devices for conversation, or fixing their eyes on image display devices while
the vehicle is in motion”. This allows them to prevent activities such as emailing or instant messaging not covered by other countries’ laws. In 2004 the penalties for these offences were strengthened, with offences now carrying a fine of up to ¥50,000 (approximately NZ$540) and an additional ‘infraction fee’ of ¥5,000-7,000 (approximately NZ$ 55-75).

Japan’s regulatory framework is also technology neutral: it is the act of communicating or watching an image that is forbidden, rather than use of the technology that enables these distracting activities.

**Policy Approaches for New Zealand**

New Zealand could adopt several policy approaches, as well as several ways of grouping or categorising these approaches.

*Prescriptive regulation*

The dominant approach of efforts to resolve problems relating to driver distraction is to ban specific technologies, or uses of technologies. In New Zealand this takes the form of forbidding (with certain exceptions and allowances) televisions and mobile phones.

Setting out specifically which devices or uses are banned is useful. It gives the public certainty, in that they can easily assess whether their actions are lawful. It also makes it easier for enforcement officers to determine and prove that someone has breached regulations.

However, prescription is not very good at addressing rapidly changing or developing situations. For example, while televisions are specifically prohibited by Land Transport Rule 2.5 (see Appendix A), there is no equivalent ban for tablets, smart phones or in-car entertainment systems used to play video. Similarly, it is unclear whether phones engaged in emailing or online messaging are in breach of telephone provisions.

In June 2014, the New Zealand Productivity Commission published a report on regulatory institutions and practice. It highlights the fact that New Zealand’s over-use of prescriptive frameworks leads to inflexible regulation. This means we must devote a significant time to amending regulations and legislation to take account of developments in technology and best practice.

The Ministry of Transport is currently undertaking a programme of work to reassess transport regulatory frameworks. Part of this work is examining opportunities for land transport regulation to become less prescriptive and more flexible, in conjunction with parallel work streams for other aviation and maritime.

The challenges of over-prescriptive legislation are expected to be magnified when dealing specifically with technology. The rate of change of some key technologies involved in transport, and which may distract drivers, seems to be increasing. It may be impractical to
continue to amend rules every time a new technology, or way of using existing technology, is developed. This makes prescription; despite being the dominant approach internationally, a less attractive option.

**Performance-based regulation**

Another way of approaching regulation is by defining a required level of performance to be met, regardless of mechanism. This enables the rule to adapt to changing technology better than prescriptive regulation. This approach is useful for regulations such as frontal impact standards, but may be less useful for preventing driver distraction if a performance standard cannot be agreed.

However, Rickard-Simms, drawing on Zhang et. al. has identified that there is more at risk if any one glance at a device exceeds two seconds, or if total time spent looking at a device to achieve a task takes more than 14 seconds.\(^{58}\) This is the sort of measure or performance standard that would be required for performance based regulation. There may be implementation issues with assessing how and when a driver is distracted.

**Principle-based regulation**

Principle-based regulation is based on making sure people act in a way that conforms to a general set of principles. It is the most flexible, and able to adapt to changes in technology.

Principle-based regulation would allow New Zealand to ban ‘dangerous distraction’. This has some shortcomings in that it does not give certainty to the regulated: it does not tell them exactly what the limits are, and it also does not tell them which new technologies will be safe to use. There may also be difficulties in the enforcement of principles based legislation. However, it is device neutral, in that new technologies or distractions will not have to be regulated individually.

**Non-binding guidelines**

Non-binding guidelines would set out criteria by which manufacturers, developers and the public could judge the risk of certain distracting activities. This would be particularly effective to respond to enquiries the Ministry has received from app developers concerned that their driving safety apps might be distracting to drivers. These guidelines would not require legislative or regulatory change, and could remain flexible as technology develops.

New Zealand’s limited ability to affect vehicle manufacturers means guidelines similar to the NHTSA’s are likely to be less effective here. However, it may be useful to prepare guidelines for members of the public, to make them aware of the need to minimise glance times, securely mount devices or use only one hand for in vehicle devices. At present there are no guidelines for the public about what devices are likely to be distracting, apart from legal bans on specific devices. Guidelines could provide this ‘middle ground’ of activities that the public should be aware of, and avoid or minimise where possible, but where legislation or regulation would not be an appropriate response.

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\(^{58}\) Yu Zhang et. al., "An Evaluation of the Visual Demands of Portable Telematics in Young Adult Drivers" Paper Presented at the 20\(^{th}\) ITS World Congress, Tokyo 2013.
Further Steps

Action 7 of the Government’s Intelligent Transport Systems Technology Action Plan 2014-2018 involves a scan of all transport legislation to identify unnecessary barriers to the continued deployment of ITS technologies in New Zealand. This will include an assessment of implications of Land Transport Vehicle Equipment Rule 2.5 and Road User Rule 7.3A given the increasing use of smart phones and tablets (or other after market devices) to provide safety and traffic information to drivers. Given the difficulty of predicting what uses might be found for smart phones in the future, it may be better to formulate more general principle-based legislation that outlaws any distraction caused by a smart phone or similar device. How this would be enforced is unclear.

Any decision will need a careful weighing up of the relative merits of producing legislation that is clear and transparent, and legislation that does not require constant amendment. Specifying specific technologies may increase certainty, but it is likely to need frequent amendment, while broad principles may adapt to changing technology, but would be less transparent to those regulated.
Bibliography


Appendix A

Land Transport Vehicle Equipment Rule 2.5

2.5 Televisions in motor vehicles

2.5(1) Except as provided in 2.5(2), any part of the image on a television screen fitted in a motor vehicle must not be visible to the driver of the motor vehicle from his or her normal driving position while the motor vehicle is in motion.

2.5(2) Subclause 2.5(1) does not apply if:

- (a) the television screen is fitted in the motor vehicle only for the purpose of assisting the driver to reverse safely, by showing a clear picture of the area directly behind the motor vehicle; or
- (b) the motor vehicle is a passenger service vehicle and the provisions of Land Transport Rule: Passenger Service Vehicles 1999 are complied with; or
- (c) the screen is fitted as original equipment by the vehicle manufacturer and is designed so that only information relating to the navigation, safe operation and control of the motor vehicle can be displayed on the screen while the motor vehicle is in motion; or
- (d) the screen is only capable of displaying text and any change to the text on the screen is controlled manually by the driver.
Appendix B

Land Transport Road User Rule

1.6 Interpretation

In this rule, unless the context otherwise requires… mobile phone—

(a) includes a portable electronic device whose functions include being a telephone:

(b) does not include a CB radio:

(c) does not include any other kind of two-way radio:

(d) does not include an earpiece or mouthpiece that is connected, physically or otherwise, to a mobile phone to allow a driver to use the phone without holding or manipulating it

7.3A Ban on use of mobile phones while driving

- (1) A driver must not, while driving a vehicle,—
  - (a) use a mobile phone to make, receive, or terminate a telephone call; or
  - (b) use a mobile phone to create, send, or read a text message; or
  - (c) use a mobile phone to create, send, or read an email; or
  - (d) use a mobile phone to create, send, or view a video message; or
  - (e) use a mobile phone to communicate in a way similar to a way described in any of paragraphs (b) to (d); or
  - (f) use a mobile phone in a way other than a way described in any of paragraphs (a) to (e).

(1A) Subclause (1) is overridden by subclauses (2) to (7).

(2) An enforcement officer may, while driving a vehicle, use a mobile phone to make, receive, or terminate a telephone call if the officer is making, receiving, or terminating the call in the execution of the officer’s duty.

(3) A driver may, while driving a vehicle, use a mobile phone if—

  - (a) the driver is using the phone to make a 111 or *555 call; and
  - (b) it is unsafe or impracticable for the driver to stop and park the vehicle to make the call.

(4) A driver may, while driving a vehicle, use a mobile phone to make, receive, or terminate a telephone call if the phone does not require the driver to hold or manipulate it to make, receive, or terminate the call.

(5) [Revoked]
(6) A driver may, while driving a vehicle, use a mobile phone to make, receive, or terminate a telephone call if the vehicle has stopped for a reason other than the normal starting and stopping of vehicles in a flow of traffic.

(7) A driver may, while driving a vehicle, use a mobile phone in a way described in subclause (1)(a) or (f), if both the following apply:

- (a) the phone is secured in a mounting fixed to the vehicle; and
- (b) if the driver manipulates or looks at the phone, he or she does so infrequently and briefly.
Appendix C

Land Transport Act 1998

Section 7

Drivers not to be reckless or dangerous

(1) A person may not drive a motor vehicle, or cause a motor vehicle to be driven, recklessly.
(2) A person may not drive a motor vehicle, or cause a motor vehicle to be driven, at a speed or in a manner which, having regard to all the circumstances, is or might be dangerous to the public or to a person.

Section 8

Drivers not to be careless or inconsiderate

A person may not drive a vehicle, or cause a vehicle to be driven, carelessly or without reasonable consideration for other persons